



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

Ans

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/930,183	08/16/2001	Takayuki Ooe	122.1465	1172
21171	7590	03/31/2004	EXAMINER	
STAAS & HALSEY LLP SUITE 700 1201 NEW YORK AVENUE, N.W. WASHINGTON, DC 20005			SHENG, TOM V	
			ART UNIT	PAPER NUMBER
			2673	

6

DATE MAILED: 03/31/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/930,183

Applicant(s)

OOE ET AL.

Examiner

Tom V Sheng

Art Unit

2673

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 5-11, 17-23, 25-30 and 32-41 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 32-34 and 37-39 is/are allowed.
- 6) ☒ Claim(s) 5-11, 17-23, 25-30, 35, 36, 40, 41 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. ____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- ☒ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 3.
- ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____.
- ☐ Notice of Informal Patent Application (PTO-152)
- ☐ Other: ____.

DETAILED ACTION

Claim Rejections - 35 USC § 112

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter, which the applicant regards as his invention.

2. Claims 25 and 29 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

As for claim 25, lines 6-7, the phrase "slits are provided at light-extracting portions of each light-emitting cell" is confusing, since the slits actually form and become the light-extracting portions. The phrase "slits are provided on the surface at the observer side of each light-emitting cell" is suggested.

3. Claim 29 recites the limitation "the slits" in line 7. There is insufficient antecedent basis for this limitation in the claim. Also, the phrase "a substrate" is unclear as to which substrate the applicant is referring to, since there are both front and back substrates.

Claim Rejections - 35 USC § 103

4. Claims 5-11, 17-23, 35-36 and 40-41 are rejected under 35 U.S.C. 103(a) as being unpatentable over Maekawa et al. (JP 2000-163013) and Yamada et al. ("Doubling of PDP Resolution for Moving Pictures by Use of a Virtual Pixel Technique", IDW '00, pages 703-706).

As to claims 5 and 6, Maekawa teaches a method of driving a display device (a display unit that performs a halftone display by the time-sharing method in the field - i.e. sub-frame method; see paragraph 1 under Detailed Description) by constructing one frame with a plurality of subframes (N subfields with different time weighting are used for display in a field - by choosing the existence of luminescence of each subfield; see paragraphs 2 and 3), to display an input image that moves on a display panel (for displaying a moving "view"; see figure 4a, which shows an image/view that moves 3 cells from right to left between time 0F and 1F where F is a frame/field, and because of the integrative nature of the visual-sense property of the human eye, the retina recognizes the view as moving to the right instead and inherently also as 3 cells; see paragraph 4), comprising:

assuming a specific pixel formed on the retina based on the input image (figure 6a, which shows pixel X4 as the specific pixel formed on the retina with input image having all 4 subfields as turned on there);

assuming tracks of each pixel formed on the retina based on a move of the input image (figure 6a; see the two dashed lines or tracks where subfields inside are integrated by the retina); and

controlling light emission of each subframe, corresponding to the tracks substantially included in an area of the specific pixel on the retina, based on a move direction and a speed of motion of the input image that moves on the display panel (the tracks formed on figures 6a and 6b corresponds to the pixel at X4 and is specific to the moving direction <right to left> and speed <3 subfields per field> of the input image; see

Art Unit: 2673

also paragraph 6 on motion vector's effect on every subfield perceived by the retina), such that luminance of the specific pixel on the retina becomes substantially equal to luminance of the specific pixel on the retina becomes substantially equal to the luminance of a pixel corresponding to the input image (by redistributing the luminescence of the 4 expressed subfields by moving the luminescence positions of each subfield to within the two dashed lines recognized by the retina; see paragraph 7). Note with the redistribution, "then an original indicative data and the indicative data which a retina actually catches are made in agreement".

In Maekawa's invention, the pitch of pixels in the display and corresponding pitch of pixel on the retina are assumed the same size. However, Maekawa does not teach a case wherein a pitch of pixels on the retina in the light emission area of each subframe that is used for displaying the specific pixel on the retina, is made shorter than a pitch of pixels on the display panel.

Yamada's invention is in the same area of moving picture display, using time-sharing driving method that is the standard method used in PDP display. In particular, Yamada teaches doubling the number of perceived pixels in a moving picture by doubling the set of sub-field arrangements with one set during the time $0 - 0.5F$ and the other set during the time $0.5F - 1F$. As a result, the pitch of pixels perceived is reduced in half and the display resolution is doubled. See figures 1c and 2c, and page 703-704 content under the heading "Virtual pixel technique." This reads on claimed pitch of pixels on the retina ... is made shorter than a pitch of pixels on the display panel and

Art Unit: 2673

claimed pitch of the pixels on the retina are selected as one half of the pitch of the pixels on the display panel.

Therefore, it would have been obvious for one of ordinary skill in the art at the time the invention was made to incorporate Yamada's virtual pixel technique into Maekawa's invention because of the resolution enhancement without the need to physically reduce the pitch size of pixels on a display panel.

As to claim 7, figures 2a - 2d shows the various uses of two sets of N subframes are provided per one frame period. In particular, N is 8 in figure 2a, 10 in figure 2b, 12 in figure 2c, and 14 in figure 2d.

As to claim 8, first N subframes of Yamada are used for first half frame period and second N subframes are used for the second half frame.

As to claim 9, the higher the speed of motion of the image the lower the resolution, and the more subframes (whether redundant or not) the higher the resolution. These factors certainly affect the pitch of the pixels on the retina.

As to claims 10 and 11, Yamada teaches (figure 2) redundant blocks in the middle of the frame, which is still located at a far end of the specific pixel on the retina and also at an end of one frame period.

Apparatus claims 17 and 18 are rejected per corresponding method claims 5 and 6.

Apparatus claim 19 is rejected per corresponding method claim 7.

Apparatus claim 20 is rejected per corresponding method claim 8.

Apparatus claim 21 is rejected per corresponding method claim 9.

Art Unit: 2673

Apparatus claims 22 and 23 are rejected per corresponding method claims 10 and 11.

Method claims 35 and 36 are rejected per corresponding method claims 5 and 6.

Apparatus claims 40 and 41 are rejected per corresponding method claims 5 and 6. Moreover, Yamada teaches two sets of subframes symmetrically provided (figure 2).

5. Claims 25-30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Maekawa et al. (JP 2000-163013) and Wada et al. (US 4692662).

As for claims 25 and 29, Maekawa teaches a display device displaying an input image that moves on a display panel by constructing one frame with a plurality of subframes (a display unit that performs a halftone display by the time-sharing method in the field - i.e. sub-frame method; see paragraph 1 under Detailed Description; and for displaying a moving "view"; see figure 4a, which shows an image/view that moves 3 cells from right to left between time 0F and 1F where F is a frame/field, and because of the integrative nature of the visual-sense property of the human eye, the retina recognizes the view as moving to the right instead and inherently also as 3 cells; see paragraph 4), comprising:

an assuming unit assuming a specific pixel on a retina that is formed on the retina based on the input image (figure 6a, which shows pixel X4 as the specific pixel formed on the retina with input image having all 4 subfields as turned on there); and

a control unit controlling light emission of each subframe such that luminance of the specific pixel on the retina becomes substantially equal to luminance of a pixel

Art Unit: 2673

corresponding to the input image (by redistributing the luminescence of the 4 expressed subfields by moving the luminescence positions of each subfield to within the two dashed lines recognized by the retina; see paragraph 7). Note with the redistribution, "then an original indicative data and the indicative data which a retina actually catches are made in agreement".

Maekawa does not teach wherein slits are provided at light-extracting portions of each light-emitting cell that constitutes the display panel, thereby to limit the effective area of the light-extracting portions or wherein a light shielding dielectric is provided on a substrate to form the slits and comprises a black color at an observer side, and a white color at a side opposite to the observer side.

Wada teaches providing an opening OP (figures 10a and 10b) on the inner surface of the front glass plate FG of each cell. Wada further teaches having white wall layers WW on both glass plates FG and RG in order to maximize reflectance from the emitted light. Wada also teaches having black light-absorbing material layers (BM) on the inner surface of the front glass plate FG above the white wall layers WW. This combination serve to first absorb most ambient light, second still generate sufficient emitted light that results in enhanced contrast (column 7, line 65 to column 8, 47; column 2, lines 40-58).

Wada further teaches the flexibility in providing the opening OP, with the critical aspect being the total area of the opening(s). See column 10, lines 23-36. One of ordinary skill in the art would recognize that Wada's opening OP reads on claimed slit,

Art Unit: 2673

white wall layer WW reads on claimed white color, and black material layer reads on claimed black color.

Therefore, it would have been obvious for one of ordinary skill in the art at the time the invention was made to incorporate an opening (slit or square or a number of smaller openings) with black and white layers at each light-emitting cell, thus enhancing the contrast of display.

As for claims 26-28, as taught by Wada, the shape or size of the opening is flexible.

As for claim 30, Wada teaches fluorescent layers Ph on the rear glass plate RG and are excited by the ultra-violet rays generated through gas discharge.

Allowable Subject Matter

6. Claims 32-34 and 37-39 are allowed.
7. The following is a statement of reasons for the indication of allowable subject matter: none of the prior arts of record teaches the common limitations "preparing at least two subframes having the same intensity level ...", "determining one pattern of light-emitting subframes ...", and "controlling light emission of subframes in the determined one pattern ..." of claims 32 and 37. Claims 33-34 and 38-39 are dependent on claims 32 and 37 respectively.

Response to Arguments

Art Unit: 2673

8. Applicant's arguments filed on 1/5/2004 have been fully considered but they are not persuasive.

As for claims 5 and 17, applicant argues that the Maekawa reference fails to teach controlling light emission of each subframe ... such that luminance of the specific pixel on the retina becomes substantially equal to the luminance of a pixel corresponding to the input image. The examiner disagrees because Maekawa teaches based on the move direction and speed of motion as shown in figures 6(a) and 6(b) to redistributes the expressed subframes such that original data and data the retina recognizes are "made in agreement". This reads on above claimed limitation.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tom V Sheng whose telephone number is (703) 305-6708. The examiner can normally be reached on 8:30am - 5:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Bipin Shalwala can be reached on (703) 305-4938. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Art Unit: 2673

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



KENT CHANG
PRIMARY EXAMINER

Tom Sheng
March 23, 2004